

I. INTRODUCTION

CMU has presented ample evidence that Marvell (1) acted despite an objectively high likelihood that its actions constituted infringement of a valid patent; and (2) the “objectively-defined risk . . . was either known or so obvious that it should have been known to [Marvell].” *Bard Peripheral Vascular, Inc. v. W.L. Gore & Assocs., Inc.*, 682 F.3d 1003, 1005 (Fed. Cir. 2012); *In re Seagate Tech. LLC*, 497 F.3d 1360, 1371 (Fed. Cir. 2007) (*en banc*).

First, CMU has offered substantial clear and convincing evidence of Marvell’s objective recklessness such that the Court should find that the objective prong has been met.¹ Marvell’s prelitigation conduct was objectively reckless because Marvell cannot establish that a reasonable actor having an internal IP policy for seeking legal advice about third-party patents would do **nothing** when at least three different parties notified it of the patents on a total of at least four occasions. Marvell’s behavior is objectively reckless regardless of the defenses Marvell could later construct during litigation when it finally took the time to analyze the scope of the patents. Furthermore, Marvell has not presented any defenses at trial on which it could reasonably expect to succeed. Marvell’s contentions regarding the time CMU took to file suit, the inventors’ testimony, and the Court’s summary judgment rulings are irrelevant distractions and insufficient to preclude a finding of objective recklessness.

Second, CMU has also offered abundant evidence to allow a reasonable jury to find subjective willfulness, i.e., that Marvell knew or should have known of the objectively defined risk that its copying and use of the Accused simulators, MNP-type and NLD-type products infringed the CMU patents. None of Marvell’s assertions regarding CMU’s actions or omissions can save Marvell from the fact that it had ample warning and reason to believe that there was a high likelihood that it was infringing because there is no evidence that, prior to this litigation, Marvell had any of the prior art or evidence that it now relies upon to support its purported defenses at trial.

Accordingly, Marvell’s Motion for Judgment as Matter of Law of no willful infringement

¹ Under *Bard*, the Court determines the objective willfulness prong as a matter of law. 682 F.3d at 1007.

fails under both the objective and subjective prongs. CMU has proved that Marvell acted despite an objectively high likelihood that its actions constituted infringement of a valid patent,² and the question of whether Marvell knew or should have known of that objectively-defined risk should be decided by the jury.

II. LEGAL STANDARD

A. General Standard for Granting Judgment as a Matter of Law

“[A] grant of JMOL is appropriate *only* where a party has been fully heard on an issue during a jury trial and the court finds that a reasonable jury would not have a legally sufficient evidentiary basis to find for the party on that issue.” *Agrizap, Inc. v. Woodstream Corp.*, 520 F.3d 1337, 1342 (Fed. Cir. 2008) (citing Fed. R. Civ. P. 50(a) and applying Third Circuit law)³ (emphasis added); *see also Rothman v. Target Corp.*, 556 F.3d 1310, 1316 (Fed. Cir. 2009) (same). When determining whether a “legally sufficient evidentiary basis” exists, the Court “may *not* weigh the evidence, determine the credibility of witnesses, or substitute [its] version of the facts for the jury’s version.” *Agrizap*, 620 F.3d at 1342 (quoting *Lightning Lube, Inc. v. Witco Corp.*, 4 F.3d 1153, 1166 (3d Cir. 1993)) (emphasis added).

Judgment as a matter of law “should be granted only if, viewing all the evidence which has been tendered and should have been admitted in the light most favorable to the party opposing the motion, *no jury* could decide in that party’s favor.” *Walter v. Holiday Inns, Inc.*, 985 F.2d 1232, 1238 (3d Cir. 1993) (internal citation and omitted); *see also Energy Transp Group, Inc. v. William Demant Holding A/S*, 697 F.3d 1342, 1350 (Fed. Cir. 2012) (Rader, J.) (“The Third Circuit conducts a plenary review of the decisions of a district court concerning judgment as a matter of law and determines whether viewing the evidence in the light most

² At a minimum, there is a sufficient evidentiary basis for the jury to the underlying “questions of fact related to objective recklessness” before the Court resolves the “legal question of objective recklessness.” *See* Dkt. 601 at 4 (Order Denying Marvell’s Motion *in Limine* D3).

³ Third Circuit authority governs this Court’s “denial or grant of a motion for JMOL.” *Agrizap*, 520 F.3d at 1341; *Union Carbide Chems. & Plastics Tech. Corp. v. Shell Oil Co.*, 308 F.3d 1167, 1185 (Fed. Cir. 2002).

favorable to the nonmovant . . . , there is insufficient evidence from which a jury reasonably could reach the conclusions that it did.”) (internal quotations omitted). Judgment as a matter of law cannot be granted if reasonable minds could differ as to the import of the evidence. *See Nobelpharma AB v. Implant Innovations, Inc.*, 141 F.3d 1059, 1064 (Fed. Cir. 1998) (“[w]e may affirm only if the judgment entered was the only one possible under the controlling law.”) (citing *Burroughs Wellcome Co. v. Barr Lab., Inc.*, 40 F.3d 1223, 1227, (Fed. Cir. 1994)); *see also Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 250, (1986) (prohibiting JMOL “[i]f reasonable minds could differ as to the import of the evidence.”).

B. The Objective Prong is Met Where There is Clear and Convincing Evidence that the Accused Infringer Acted Despite an Objectively High Likelihood that its Actions Constituted Infringement of a Valid Patent.

1. The Court’s Inquiry Into Objective Recklessness Must Focus on Marvell’s Prolitigation Conduct and Defenses.

The Federal Circuit (*en banc*) has expressly stated that “in ordinary circumstances, willfulness will depend on an infringer’s *prolitigation conduct*.” *In re Seagate*, 497 F.3d at 1374 (emphasis added) (“willful infringement in the main must find its basis in prelitigation conduct....”); *see also Univ. of Pittsburgh v. Varian Med. Sys., Inc.*, No. 08-01307, slip op. at 17, 38 (W.D. Pa. Dec. 30, 2011) (the willfulness inquiry “focuses on the infringer’s pre-litigation conduct”).⁴ Thus, the Court’s inquiry under the objective prong must focus on whether Marvell acted objectively recklessly *at the time of infringement*. *i4i Ltd. P’ship v. Microsoft Corp.*, 670 F. Supp. 2d 568, 581-82 (E.D. Tex. 2009) (“the objective prong of the *Seagate* standard ‘focuses on an “objective” view of the facts and circumstances surrounding an accused infringer *at the time that it acts*.’”) (emphasis added), *aff’d*, 598 F.3d 831, 860 (Fed. Cir. 2010); *CSB-Sys Int’l Inc. v. SAP Am., Inc.*, No. 10-2156, 2012 WL 1439059 at *4 (E.D. Pa. April 25, 2012) (“Notably, the objective test focuses on facts and circumstances available to the accused *at the time the action under scrutiny was taken*.”).⁵

⁴ *See also Univ. of Pittsburgh v. Varian Med. Sys. Inc.*, No. 08-01307, 2012 U.S. Dist. LEXIS 90893, at *29 - 31 (W.D. Pa. June 29, 2012).

Moreover, to overcome willful prelitigation conduct, defendant must have objectively reasonable defenses *at the time of infringement began*. See *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1310 (Fed. Cir. 2011) (objective prong was not met where there was no evidence showing the defenses did not exist *at the time it began infringement*); *CSB-System Int'l Inc. v. SAP Am., Inc.*, 10-2156, 2012 WL 1439059 at *9 n.7 (E.D. Pa. Apr. 25, 2012) (“The Court is required to consider whether, *at the time the infringement occurred*, it was objectively reasonable for an accused in Defendant’s position to rely on certain defenses. To the extent defenses arise during the course of the proceeding that were not reasonably available at the time of the alleged infringement, an accused could not reasonably rely on them.”) (emphasis in original); *i4i*, 670 F. Supp. 2d at 581 – 82 (“[T]he correct analysis focuses on whether, *given the facts and circumstances prior to [defendant’s] infringing actions*, a reasonable person would have appreciated a high likelihood that acting would infringe a valid patent.”) (emphasis added).⁶

2. The Totality of the Circumstances Inform Whether Prelitigation Conduct is Objectively Reckless

Evidence supporting a finding of objective recklessness can include: (1) a defendant acting despite knowledge of the patents;⁷ (2) a defendant’s failure to obtain any opinion of

⁵ See also *Goss Int’l Americas, Inc. v. Graphic Management Assoc., Inc.*, 739 F. Supp.2d 1089, 1125 -26 (N.D. Ill. 2010) (“Special Master Harmon *properly focused* on the *totality* of the Defendants’ *pre-litigation conduct* and concluded that it constituted fair and reasonable commercial conduct” where Defendants sought an opinion of counsel, independently obtained and evaluated the file history, and pursued a license from Goss’s predecessor in interest.) (emphasis added); *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 725 F. Supp. 2d 474, 476 (D. Del. 2010) (“The Court must examine the totality of the circumstances” and would “focus on the prelitigation conduct of the accused infringer in the first instance but must also taken into account whether the accused infringer maintained plausible or credible defenses to [] infringement and invalidity.”).

⁶ See also *Metso Minerals, Inc. v. Powerscreen Int’l Distrib. Ltd.*, 833 F. Supp. 2d 282, 307 (E.D.N.Y. 2011) (despite finding obviousness defense not frivolous, denying renewed JMOL of no willfulness because defendants did not indicate they knew of the prior art at the time of infringement); *Power Integrations*, 725 F. Supp. 2d at 480 (permitting the “post-suit, reasonableness of a parties’ defenses” to necessarily outweigh objectively reckless conduct “would negate the ability of a patentee to prove willful infringement in any hard fought and hotly contested patent litigation”).

⁷ *Great Dane Ltd. P’ship v. Stoughton Trailers, LLC*, No. 3:08-89, 2011 WL 318092, at *4-5 (M.D. Ga. Jan. 28, 2011) (defendant who had knowledge of the patents could “be considered objectively reckless if it proceeded” with manufacturing products without assessing infringement in spite of its knowledge of the patents); *Krippelz v. Ford Motor Co.*, 670 F. Supp. 2d. 806, 809, 811 - 812 (N.D. Ill. 2009) *rev’d on other*

counsel;⁸ (3) copying;⁹ (4) a defendant's failure to investigate the scope of the patent (i.e., not reading the file history);¹⁰ and (5) a defendant's failure to take any remedial action to avoid or stop infringement.¹¹

In *i4i*, the Federal Circuit pointed to circumstantial evidence of knowledge of the patent that included an email between Microsoft employees that explained that the “‘heart’ of i4i’s software was patented.” *i4i*, 598 F.3d at 860. Despite this knowledge of the patent as early as 2001, Microsoft “did not cease its infringing activity or attempt to design around; instead, Microsoft started marketing, selling, and instructing others in the use of Microsoft’s custom XML editor in 2002.” *Id.* The Federal Circuit held a reasonable jury could “infer that Microsoft went ahead producing, marketing, and promoting its [product] despite an objectively high

grounds 667 F.3d 1261 (finding willful prelitigation conduct where, despite actual knowledge of the patent, the defendant did not investigate the patent and failed to produce any allegedly invalidating prior art for nearly two years after it began infringing sales); *see also i4i*, 598 F.3d at 860 (finding willfulness verdict supported by sufficient evidence to prove both prongs of the *Seagate* standard, where the evidence included Microsoft’s knowledge of the patent).

⁸ *Seagate*, 497 F.3d at 1369 (“Although an infringer’s reliance on favorable advice of counsel, or conversely his failure to proffer any favorable advice, is not dispositive of the willfulness inquiry, it is crucial to the analysis.”); *Koninklijke Philips Elecs. N.V. v. Cinram Int’l, Inc.*, No. 08-0515, 2012 WL 4074419 at *5 n. 17 (S.D.N.Y. Aug. 23, 2012) (absence of advice implicates both objective and subjective prongs of *Seagate*).

⁹ *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 725 F. Supp. 2d 474, 480 (D. Del. 2010) (copying relevant to both *Seagate* prongs because evidence of copying was strong and measures taken by infringer to avoid infringement were so weak “that it is hard to understand how one could objectively believe such actions would not constitute a high likelihood of infringement.”).

¹⁰ *Goss*, 739 F. Supp.2d at 1126 (finding defendants were not objectively reckless where “[o]nce the [d]efendants became aware of the application that eventually evolved into the ‘724 patent, they obtained a copy of the file history and began evaluating whether the patent was valid or infringed. [They] concluded that the ‘724 patent was likely invalid in light of the prior art.”); *see also SunTiger, Inc. v. Scientific Research Funding Group*, 9 F. Supp.2d 601, 607 (E.D. Va. 1998) ([T]he [opinion of counsel] letter may not be as ‘important’ as [defendant] claims, as it appears that it would be incompetent to shield [defendant] from a finding of willfulness because it was not based on a file history study.”).

¹¹ *i4i*, 598 F.3d at 860 (“Despite this highly similar functionality, there is no evidence Microsoft took any remedial action, even though Microsoft knew of the ‘449 patent as early as April 2001, before any work had begun on Word’s custom XML editor.”).

likelihood that [it] infringed,” and that “[t]his same evidence supports the jury’s finding under the subjective prong.” *Id.*

In a post-*Seagate* retrial on willfulness, the *Power Integrations* court considered the “totality of the circumstances” and held that both the objective and subjective prongs were met where evidence showed that, prior to the filing of the action, defendant was aware of the patents, recognized their importance to the industry and described them as “key patents,”¹² developed its products by copying and with little or no effort to ensure non-infringement, and sought no opinions of counsel. 725 F. Supp. 2d at 476, 478, 480 – 81.

3. The Assertion of Post-Litigation Defenses Does Not Necessarily Preclude A Finding of Objective Recklessness.

Following *Seagate*, the Federal Circuit “established the rule that *generally* the objective prong of *Seagate tends* not to be met where an accused infringer relies on a *reasonable* defense to a charge of infringement.” *Bard*, 682 F.3d at 1005. Therefore, simply asserting defenses at trial does not preclude a finding of objective reckless because the reasonableness of those defenses needs to be determined “based on the record ultimately made in the infringement proceedings.” *Bard*, 682 F.3d at 1008; *see also Fractus, S.A. v. Samsung Electronics Co., Ltd.*, 6:09-CV-203, 2012 WL 2505741, * 19 (E.D. Tex. June 28, 2012) (“However, the fact that

¹² CMU has offered substantial evidence regarding the “must have” value of its patents to Marvell and showing Marvell’s own recognition of the importance of the patents. *See, e.g.*, P-320 ([W]e must have MNP in 7500 ASAP to be competitive – no one disagreed.”); P-328 (“MNP for C7500 is critical requirement for Hitachi and Fujitsu. . . .”); P-603 (2007 email: “the Flight Height measurement has been the latest greatest idea for the HDD guys to increase the drive density (besides NLV!!!).”); P-607 (2007 email: “[N]ow days the drives are dominated by media noise, and MNP and NLV is a must.”); P-703 (2008 promotion of Zining Wu: “Zi-Ning and his DSP team have been instrumental in the development of the Media Noise Processsor (MNP) and Advance ECC (AECC) . . . The introduction of these technologies has helped firmly establish Marvell as the market leader in the HDD IC business.”). Even Marvell in its opening statement told the jury that the claimed methods are the “gold standard.” 11/28/12 Tr. at 156:13 – 156:14, 166:15 -166:19 (“And you will hear that there was one simulator that Mr. Burd used -- and he’ll testify to you about it openly; it’s no secret -- where he created in a computer a software code that would use the gold standard, . . . , based on the published works of Kavcic and Moura.”); *see also* 12/3/12 Tr. at 167:4 – 167:19, 169:1 – 170:19 (Burd testifying that KavcicViterbi was a “launching pad” and used for “benchmarking” performance); *see also id.* at 171:19 – 173:14 (Doan testifying that “we continuously run Kavcic algorithm to benchmark any subsequent algorithm that we develop at Marvell” and Burd testifying that is a “yardstick” because Dr. Kavcic is a “VIP” and “on the cutting edge” of the field).

Samsung presented several defenses at trial, including non-infringement and invalidity, does not mean the jury's willfulness finding lacks a sufficient evidentiary basis.") (*quoting i4i Ltd. Partnership v. Microsoft Corp.*, 598 F.3d 831, 860 (Fed. Cir. 2010)); *ALA Eng'g Ltd. v. Magotteaux Int'l S/A*, 3:09-CV-00255, 2012 WL 4442665, at *5 - *6 (M.D. Tenn. Sept. 21, 2012) ("Yet, ***the mere existence of a defense cannot preclude that possibility of an objectively high likelihood of infringement.*** Indeed, those who knowingly infringe a patent presumably attempt to manufacture defenses, however contrived and unavailing they may prove.") (citing *Tomita Techs. USA, LLC v. Nintendo Co., Ltd.*; No. 11-Civ-4256(JSR), 2012 WL 2524770, at *9 (S.D.N.Y. June 26, 2012)).¹³

Post-*Bard*, the Federal Circuit has affirmed the denial JMOL of no willful infringement and rejected an accused infringer's arguments that its non-infringement and invalidity defenses precluded a finding of objective recklessness. *K-Tec, Inc. v. Vita-Mix Corp.*, 696 F.3d 1364, 1378 (Fed. Cir. 2012) ("[Plaintiff] presented evidence that, in designing the [infringing] product, [Defendant] started with . . . a direct copy of [Plaintiff's product]—and made only a trivial change. Specifically, [Plaintiff] offered evidence that, rather than adopting one of numerous noninfringing designs, [Defendant] opted for a design that allowed [Defendant] to produce a container that performed in the same way as the [direct copy] and employ a design that its customers would not be able to distinguish from the [direct copy]."). Similarly, after reviewing the objective record under *Bard*, the *Fractus* court denied JMOL of no willfulness because Samsung's invalidity and non-infringement defenses were weak and flawed. *Fractus*, 2012 WL 2505741, *19 - *20 (noting, for example, that "Samsung attempted to argue that its antennas were not 'planar' because they include notches and holes, despite referring to its own antennas as 'planar inverted-f antennas (PIFA).'""); *accord ALA Eng'g Ltd.*, 2012 WL 4442665, at *5 - *6.

¹³ Some courts have found that post-litigation defense are in fact irrelevant to the objective prong. *i4i*, 670 F. Supp. 2d. at 581- 82 ("[T]he number of creative defenses that [the defendant] is able to muster in an infringement action after years of litigation and substantial discovery is irrelevant to the objective prong of the *Seagate* analysis.").

C. The Federal Circuit Permits Judgment of as a Matter of Law on the Subjective Prong Only If There Is a Complete Absence of Substantial Evidence that Marvell Knew or Should Have Known of the Objective Risk.

“Once the threshold objective standard is satisfied, the patentee must also demonstrate that this objectively-defined risk . . . was either known or so obvious that it should have been known to the accused infringer.” *Bard*, 682 F.3d at 1005 (citing *Seagate*, 497 F.3d at 1368). Under the subjective prong, the accused infringer does not have to have had actual knowledge of the scope of the patent in order to adequately comprehend the risk faced. *See Tomita Techs.*, 2012 WL 2524770, at *10 (“To require actual knowledge of the patent at issue in circumstances such as these—where evidence suggests that the alleged infringer knew of the value of an invention, . . . and of the similarity between the allegedly infringing product and the invention—would allow even copiers to shelter themselves from liability for willfulness merely by avoiding confirmation of what they, in essence, already knew.”).

III. ARGUMENT

A. CMU Has Presented Clear and Convincing Evidence To Establish That Marvell Acted Despite an Objectively High Likelihood That Its Actions Constituted Infringement of a Valid Patent

The Court should deny Marvell’s JMOL and find that the objective prong is met for at least three reasons. *First*, CMU has proved with abundant evidence that Marvell’s prelitigation conduct was objectively reckless because Marvell: (1) acted despite having knowledge of the patents; (2) did not to obtain an opinion of counsel; (3) ignored its own intellectual property policy; (4) failed to respond to a customer request for a “opinion” about whether specific (and now accused) Marvell read channel chips infringe the CMU Patents; (5) copied the CMU Patents; (6) failed to investigate the scope of the claims through a review of the file history; and (7) failed to take any remedial action. Marvell’s inaction is not fair and reasonable commercial behavior.¹⁴

¹⁴ At a minimum, this evidence is more than sufficient for the jury to consider the “questions of fact related to objective recklessness” before the Court resolves the “legal question of objective recklessness.” *See* Dkt. 601 at 4 (Order Denying Marvell’s Motion *in Limine* D3).

Second, Marvell did not have any objectively reasonable defenses *at the time of infringement* that can overcome its egregious prelitigation conduct. Marvell's lack of prelitigation defenses is illustrated by Dr. Wu's testimony that he failed to look at the file history or seek any advice about the patents outside the patent prosecution process, which an objectively reasonable person would know is not a non-infringement or invalidity opinion.¹⁵

Third, CMU has shown through cross-examination of Marvell's witnesses at trial that Marvell has no evidence to support any post-litigation defenses upon which Marvell could realistically expect to succeed.¹⁶ Furthermore, none of the evidence Marvell points to—the passage of time before CMU filed suit, inventors' statements regarding the scope of the patents, or the Court's summary judgment decision—amount to “*reasonable* defense[s] to a charge of infringement,” *Bard*, 682 F.3d at 1005, such that the jury should be precluded from determining the facts underlying the objective prong or deciding whether the subjective prong has been met.

1. Marvell's Prelitigation Conduct Was Objectively Reckless

a. CMU Has Proved that Marvell Acted Despite Knowledge of the CMU Patents

It is undisputed that Marvell had knowledge of the CMU Patents well before this litigation. In March 2001, Greg Burd, a Marvell engineer, told Toai Doan (his supervisor), that he had started working on “Kavcic's model.” P-227; 12/3/12 Tr. at 53:14 – 54:17. By late 2001, Mr. Burd had “developed sub-optimal media noise detector based on Kavcic model,” which he called a “Media Noise Detector.” P-279 (December 28, 2001 letter from Mr. Burd to Toai Doan); 12/3/12 Tr. at 57:16 – 57:24; P-196 (Burd lab notebook); 12/3/12 Tr. at 56:18 – 57:15 (lab notebook reflects Mr. Burd's notes about “media noise detector” refers to “Kavcic model” and “simplified Kavcic PP,” which is a block diagram of the MNP technology). Shortly thereafter, by at latest January 3, 2002, Marvell's executives were told by Mr. Burd that the

¹⁵ Pursuant to an pre-trial agreement with Marvell, CMU is permitted to rely in testimony from Dr. Wu and Mr. Burd as part of its case-in-chief.

¹⁶ CMU may supplement and/or otherwise amend this opposition after Dr. Proakis offers his invalidity opinions.

Kavcic-Moura invention he was working on was patented and assigned to CMU. *See* P-280 (email from Greg Burd to Nersi Nazari and Toai Doan: “Kavcic’s detection scheme is patented (assignee: Carnegie Mellon Univ., 2001.”); P-283 (January 4, 2002 email from Greg Burd to Toai Doan, Nersi Nazari, and Ke Han stating: “And of course as I mentioned earlier, Kavcic detector is also patented.”); 12/3/2012 Tr. at 73:13 – 74:11. When asked whether he ever formed an opinion as to whether he was practicing the inventions of the patents, Mr. Burd testified at his deposition: “I looked, . . . , through the patent, . . . I seem to recall that I felt it was generally following the papers, and I left it at that.” 12/3/12 Tr. at 76:25 – 77: 15.¹⁷ Dr. Wu and Mr. Doan both testified that they became aware of the patents in 2002. 12/11/12 Tr. at 322:18 – 322:24 (Dr. Wu); 12/10/12 Tr. at 262 (Mr. Doan).

In August 2003, shortly after Marvell had shipped its first MNP products,¹⁸ CMU informed Marvell of the patents. P-422; P-431. Specifically, CMU sent two letters to Marvell’s CTO and General Counsel enclosing copies of the patents. *Id.*; 11/30/12 Tr. at 120:2 – 121:7; 12/5/12 Tr. at 143:20 – 145:16; 12/12/12 Tr. at 286:10 – 286:24. Marvell did not respond. 12/7/12 Tr. at 164-165.

In 2004, more than two years after Mr. Burd’s emails concerning the patents, and not long after Marvell’s MNP chips for Fujitsu went into volume production,¹⁹ Marvell received a letter from Fujitsu inquiring about the patents in reference to Marvell’s 5575M and 7500M read channel chips. P-477.

b. *CMU Has Presented Evidence that Marvell Failed to Obtain an Opinion of Counsel or Even Review the Patents.*

¹⁷ Mr. Burd’s testimony will be part of CMU’s case-in-chief whenever he appears in person or via 30(b)(6) deposition. CMU may supplement and/or otherwise amend this opposition with additional testimony from Mr. Burd.

¹⁸ *See* 12/4/12 Tr. at 239:13– 243:18 (volume production of Marvell’s first MNP chips began in approximately June 2003).

¹⁹ 12/4/12 Tr. at 241:23– 242:19 (Marvell’s first MNP products for Fujitsu went into volume production of in October 2003).

Toai Doan testified that he received the Mr. Burd's letter indicating that Kavcic's detector was patented (P-280), but that he didn't "recall that I did **anything** in response to this email." 12/10/12 Tr. at 262.²⁰ With regard to the January 4, 2002 email, sent a day later, Mr. Doan testified:

- Q. So what did you do in response to receiving this e-mail?
A. *I don't recall. I don't recall what I did. In fact, I don't recall trying to do anything.*
Q. Did you get a copy of the Kavcic patents?
A. *Nope.*
Q. Did you read the Kavcic patents?
A. *Nope.*
Q. Did you understand that the Kavcic detector was patented by this time?
A. *Greg is informing me that Kavcic has patented his algorithm in his email.*
Q. Did you believe his statement?
A. *I have no reason to disbelieve that his is telling me the truth.*
Q. Did you ever talk to anybody at Marvell about the Kavcic patents?
A. *No, since I never read patent—the patent that you're referring to.*

12/10/12 Tr. at 262²¹. At the time Mr. Doan received notification of the patents, he was a "princip[al] engineer of the signal processing group with managerial responsibility" and shortly thereafter, in "[e]arly 2002," he was promoted to Vice-President of Read Channel Development, and in late 2002 he took over management of "both read channel and signal processing." *Id.*²²

A year later, Mr. Doan, as Vice-President of Read Channel Development and Signal Processing received yet another email relating to Dr. Kavcic's work. P-366. Mr. Doan testified about his response:

- Q. The next sentence says, "***It turns out to be the original structure that Kavcic proposed in his paper.***" Do you see that?
A. *Yes.*
Q. I mean this e-mail is from January 10th, 2003. So by this point you knew that Kavcic had a patent on his detector, correct?
A. *As indicated by the status report from Greg, yes.*
Q. So did you bother to look at Kavcic's patents after you were told by Zi-Ning that Greg and Zi-Ning had been working on a structure that turned

²⁰ Doan Depo. at 124:22 – 125:16, 125:18 – 125:19.

²¹ Doan Depo. at 129:18 – 130:01, 130:04 – 130:08) (emphasis added).

²² Doan Depo. at 16:24 – 17:08, 17:15 – 17:25.

- out to be the original structure that Kavcic proposed in his paper?
- A. ***As I mentioned before, I have never looked at Kavcic's patent.***
- Q. In response to receiving this e-mail, did you suggest to Greg Burd that he look at the Kavcic patents?
- A. ***I don't recall directing people to look at Kavcic's patent.***
- Q. So do you recall telling -- who did I ask about, Greg Burd? Do you recall asking Zi-Ning Wu to look at the Kavcic patents?²³
- A. ***I don't recall asking my engineer to look at Kavcic's patent.***
- Q. At this point, did you care whether Kavcic had a patent?
- A. ***At this point, I am only aware that Kavcic has a patent.***
- Q. But you didn't care?
- A. ***I am aware of Kavcic's -- that Kavcic has a patent.***
- Q. But did you care that he had a patent?
- A. ***I don't have any particular feeling about Kavcic's patent.***
- Q. Did it occur to you to consult with Marvell legal counsel when you read this e-mail about the Kavcic patents?
- A. ***I did not consult with counsel about Kavcic's patent.***

12/10/12 Tr. at 262.²⁴ It is not commercially reasonable for a Vice-President who is informed that his engineers are working on a patented technology to take no action whatsoever to establish what risk there may be of infringement.²⁵

c. *CMU Has Proved that Marvell Ignored its Own Intellectual Property Policy By Not Asking Its Legal Department to Analyze the CMU Patents.*

Marvell's utter failure to act is especially egregious (and reckless) in the face of Marvell's own IP Policy. Dr. Armstrong, Marvell's Vice President of Marketing, testified: "Any information we might get about patents, either externally or internally, ***the policy would be to send that to legal and to have legal analyze the patent and determine what the appropriate***

²³ Dr. Wu subsequently testified that he reviewed the patent with Marvell's in-house counsel, Eric Janofsky. 12/11/12 Tr. at 323:9 – 24. But, Marvell's counsel has previously represented to the Court, and CMU, that Marvell would ***not*** assert the opinion of counsel defense. See Telephone Status Conference (Aug. 27, 2010) [Ex. 3 to Opp. To MIL D3] at 77 ("MR. McELHINNY: I appreciate the concession that there have been no written or oral communications with outside counsel, ***but I want to understand what the situation is with inside counsel, and whether Marvell will be asserting that they have an opinion of some sort or another from its inside counsel.***" "MR. RADULESCU: Yes. On that issue the answer is, ***no, we will not be asserting the advice of counsel defense*** and the further communication, Your Honor, and I'll just be pretty straightforward about it.").

²⁴ Doan Depo. at 188:1 – 188:5, 189:05 – 189:08, 191:06 – 191:08, 191:10 – 191:16, 191:18 – 191:19, 192:09 – 192:10, 192:12 – 192:17, 192:19 – 192:20, 192:22 – 192:23, 192:25 – 193:03, 193:05 – 193:08, 193:10 – 193:11, 193:25 – 194:04 (emphasis added).

²⁵ As discussed further below, Dr. Wu's subsequent *in camera* testimony establishes that his conduct was also objectively reckless. See *infra*, pp 19-20.

next step would be.” 12/5/12 Tr. at 251- 252;²⁶ *see also id.* (Armstrong Depo. at 303:15 – 303:19 (“[I]f someone at Marvell becomes aware of a patent that may cover the technology that Marvell is employing, is it Marvell policy that that information has to be forwarded to legal.”); *id.* at 304:05 to 304:10, 304:12 (“[T]he obligation of Marvell employees with respect to patents is to respect them and to communicate with legal any time someone becomes aware of technology that—or a patent that may cover technology that Marvell is employing.”)).

But Dr. Armstrong also testified that he did not know whether the CMU patents were ever sent to Marvell’s legal department and he was “not aware of any discussions that were had internally about licensing the CMU [patents].” 12/5/12 Tr. at 251- 252.²⁷

d. *CMU Has Proved that Marvell Failed to Respond to Fujitsu’s Request for An “Opinion” About Whether Accused Marvell Read Channel Chips Infringe the CMU Patents*

CMU has shown that Fujitsu sent Marvell a letter specifically requesting an opinion on CMU’s patents:

Since it seems that these patents might be related to read channel, *we would like to know, by the end of November, your opinion regarding relationship between CMU’s Patents and the above Marvell’s lead [sic] channel [5575M and 7500M] and the specific grounds/reasons for such opinion.*

P-477 (emphasis added).

Dr. Armstrong again testified that “our process in the company is if somebody receives something like that [P-477] would be to forward it to legal, and then legal take the appropriate actions, and if one of those appropriate actions was to contact me, they would contact me.”

12/5/12 Tr. at 251- 252²⁸; *see also id.* (Armstrong Depo. at 534:10 to 534:14 (“The response to a letter like this would have been to forward it to legal and have legal determine the appropriate action.”)).

²⁶ Armstrong Depo. at 294:14 – 294:21, 294:24 – 295:03) (emphasis added).

²⁷ Armstrong Depo. at 295:05 – 295:07, 295:12, 295:16 – 295:18, 299:21 – 299:23.

²⁸ Armstrong Depo. at 531:05 – 531:13, 531:22 – 532:19.

Notwithstanding his acknowledgment of what should have happened with the Fujitsu inquiry, Dr. Armstrong testified that he did not know whether anyone at Marvell communicated back to Fujitsu in response its request for an opinion on the CMU patents. 12/5/12 Tr. at 251-252.²⁹ Moreover, Marvell's counsel confirmed that in response to CMU's discovery requests, Marvell searched for documents in response to Fujitsu's inquiry, but it did not find any such responses. 12/5/12 Tr. at 251-252.³⁰

e. CMU Has Proved that Marvell Copied³¹ the CMU Patents.

CMU has set forth substantial evidence that Marvell copied the work of Drs. Kavcic and Moura and incorporated it into the accused simulators and chips.

A few months after he began working on the Kavcic model, Greg Burd prepared a "preliminary write up" of the "KavcicPP" detector titled "Detection in the Presence of Media Noise." which references the work Drs. Kavcic and Moura. P-280 (attachment states "This paper presents a sub-optimal version of Kavcic's Detector . . .");³² 12/3/12 Tr. at 65:14 – 67:10 (file name of Greg Burd's January 2, 2012 write up is "Kavcic PP"); *see also* P-283 (January 4, 2002 email from Mr. Burd again attaching KavcicPP write up as well as performance data from KavcicPP simulator (sub-optimal Kavcic detector) and (optimal) Kavcic detector); 12/3/12 Tr. at 73:25 – 76:16.

Dr. McLaughlin testified that this "KavcicPP" write up describes Marvell's MNP circuit: the simplified Kavcic PP was the "basis" for the MNP. *Id.* at 66:15 – 67:21; *see also id.* at 72:15

²⁹ Armstrong Depo. at 533:08 - 533:14.

³⁰ Armstrong Depo. at 533:19- 534:06, 534:08 - 534:08, 534:10 - 534:14, 535:18 - 535:22.

³¹ As indicated above, some courts find copying relevant to both the objective and subjective prongs because an objective actor cannot flagrantly copy without taking any measures to avoid infringement and at the same time reasonably believe there is not a high likelihood of infringement. *See, e.g., Power Integrations*, 725 F. Supp. 2d at 480. Likewise, because there is no evidence that Marvell sought counsel on the patents or attempted to design around them, we discuss copying under the objective prong. Nonetheless, the same evidence of copying is substantial evidence that Marvell knew or should have known of the risk of infringement such that Marvell is not entitled to JMOL on the subjective prong.

³² The email to which the write-up is attached is the same January 3, 2002 email in which Mr. Burd first informs his superiors of the patents. *See* P-280; 12/3/12 Tr. at 73:13 -74:24.

– 73:12 (diagram of the “media noise detector” in Burd’s write up (P-280) is the same as the “KavcicPP” diagram in Burd’s lab notebook); *id.* at 85:11 – 86:11 (both the Kavcic PP diagram on page 897 of P-196 and the Simplified Kavcic PP diagram on Page 900 of P-196 appear on page 3 of the P-280 (the MNP write-up) and the simplified Kavcic PP is the same as the media noise detector in Fig. 2 of P-280 and served as the “basis for the MNP.”).³³

Moreover, the Kavcic and Moura paper, which Burd’s write-up for the MNP relies on, is “virtually identical to what’s described in the CMU patents.” *Id.* at 66:15 – 67:21; *id.* at 77:20 – 78:18 (“’180 Equation 13, is actually the exact same Equation 13 in the 1998 papers,” and Fig. 3B from the ’180 patent shows the FIR filter described in P-169); *id.* at 78:21 – 79:10 (Equation 13 in the patent is also in P-183); P-183 (2000 IEEE paper); P-169 (1998 IEEE Paper).³⁴ See also 11/29/2012 Tr. at 68:16 – 69:17 (Dr. Moura testifying that the FIR filter implementation of the 2000 paper is in the patents); 11/30/12 Tr. at 154:15 – 154:25 (Dr. Kavcic testified that “[w]hat is described in this article is exactly the methods of the patents.”); *id.* at 155:5 – 158:11 (Dr. Kavcic testified that equation 19 in the article is equation 13 in the ’180 patent, “[s]o what is described in this paper is exactly the same content that was described in the patent.”). Furthermore, Greg Burd testified that he reviewed the patent and he thought that the patent followed the papers. 12/3/12 Tr. at 76:25 – 77:15.

Marvell implemented both the optimal Kavcic detector and Kavcic PP it had copied from Drs. Kavcic and Moura’s papers in simulators. P-110 (Kavcic PP code); 12/3/12 Tr. at 75:20 – 76:24 (testifying about performance data from the simulators). Dr. McLaughlin testified that code that for the KavcicViterbi simulator—which Marvell uses as the gold standard—implements the claims of the patents. P-93 (Kavcic Viterbi code); 12/3/12 Tr. at 54:18 – 55:11; *id.* at 171:25 – 127:20 (KavcicViterbi simulator uses the method in CMU’s patents); *id.* at 173:19 – 175:14 (same). This was corroborated by Mr. Burd’s testimony that the code for the

³³ See also P-DEMO 7 at slides 17, 23.

³⁴ See also P-DEMO-7 at slides 30 – 33 (demonstrating to the jury that the equations in P-169 and P-183 are in the ’180 Patent).

“KavcicViterbi.cpp class, written by engineers in Marvell, . . . contains the implementation, as understood by our architecture team, of the IP which is taught in Professor Kavcic’s papers, and consequently in his patent.” 12/3/12 Tr. at 167:4 – 167:19, 169:1 – 170:19 (Burd testifying that KavcicViterbi was a “launching pad” and used for “benchmarking” performance); *see also id.* at 171:19 – 173:14 (Doan testifying that “we continuously run Kavcic algorithm to benchmark any subsequent algorithm that we develop at Marvell” and Burd testifying that is a “yardstick” because Dr. Kavcic is a “VIP” and “on the cutting edge” of the field); P-DEMO-7 at 107 – 110; 12/11/12 Tr at 302:3 – 302:16 (Zining Wu testifying: “Kavcic Viterbi is a simulator that simulates the method proposed by Dr. Kavcic in his paper. . . . So we use that simulator to benchmark our own development.”).

Moreover, the Kavcic PP code for the MNP is ultimately in Marvell’s MNP Chips. 12/3/12 Tr. at 75:20 – 76:24 (testifying that the Kavcic PP code ultimately is what is in Marvell’s MNP chips); *id.* at 86:7 – 86:11 (“They [Marvell] used this simplified Kavcic PP, served as the basis for the MNP.”); *see also* 12/11/12 Tr at 302:3 – 302:16 (Zining Wu testifying: “Kavcic PP actually means MNP.”). In fact, a year after Mr. Burd’s first emails containing his write up for the MNP, Marvell “disassociated” Dr. Kavcic from the MNP by renaming the Kavcic PP (and associated code files) “MNP.” P-368; 12/3/12 Tr. at 79:13 – 81:15; *see also* 12/11/12 Tr. at 307:3 – 308:2 (Dr. Wu testifying that Marvell initially named its MNP simulator “KavcicPP” and that it then changed the name of the simulator to MNP “[I]ater, when MNP product started to roll out, more people are involved in the simulation.”). Notably, Marvell’s engineers said that despite the name change, there was “no functional difference between the old and new codes” and that its engineers could “continue to use the old set up.” *Id.*³⁵

In January 2003, Zining Wu informed his boss Toai Doan that the NLD (or “MNP Enhancement”) he and Greg Burd were working on turned out “to be *the original structure that Kavcic proposed in his paper.*” P-366 (“Greg and I discussed the approach of using a different noise whitening filter for each branch.”); 12/3/12 Tr. at 134:19 – 135:15. Dr. McLaughlin

³⁵ *See also* P-DEMO-7 at slides 34 – 36.

verified that the NLD does, in fact, use the “original structure proposed in [Kavcic’s] paper.” *Id.* at 136:1 – 137:4; *see also* P-596 (NLD Application Note states that “NLD has noise whitening built into the branch metric (BM) calculation.”).

After reviewing Drs. Kavcic and Moura’s papers as well as Mr. Burd’s files, Marvell’s code for the KavcicPP/MNP and Kavcic Viterbi, and other Marvell documentation, Dr. McLaughlin mapped the claims of the CMU patents to Marvell’s MNP and NLD and its simulations and concluded that Marvell copied the papers of Drs. Kavcic and Moura knowing that the CMU patents followed those papers. 12/3/12 Tr. at 81:16 – 82:18; *id.* at 86:7 – 86:11 (the simplified Kavcic PP, which Mr. Burd copied from Kavcic-Moura papers, “served as the basis for the MNP).

f. CMU Has Proved that Marvell Failed to Take Any Remedial Action.

An objectively reasonable commercial actor, with knowledge of patents, not only would investigate or analyze them, but also would attempt to design around them. *See, e.g., i4i*, 598 F.3d at 860. There is, however, no evidence that Marvell attempted to use an alternative solution or design around the CMU patents.³⁶ To the contrary, when asked what actions Marvell took to avoid infringement, Mr. Burd testified that he was “not aware of any changes, modifications, or actions which have been taken to avoid the obstruction or infringing on Kavcic’s IP.”³⁷ Moreover, Marvell has continued to use the patented methods and, as Mr. Burd testified at his deposition, Marvell has no plans to stop:

- Q. In connection with your work at Marvell, and as Marvell’s designee on technology issues, are you aware of any plans by the company to stop production of read channel technology with non-linear Viterbi detectors in them?
- A. ***No, I am not.***

12/3/12 Tr. at 194:2 – 195:3 (Dr. McLaughlin also testified that Mr. Burd’s testimony was not surprising because the accused technology is the optimum solution that needs to be in the

³⁶ Although Marvell received its own patents, these are improvement patents, and are not a defense to infringement or evidence of “designing around.”

³⁷ Burd Depo. Designations at 1127:12 – 1127:14, 1127:16 – 1127:19 (to be played 12/17/12).

chips).³⁸

2. Marvell Had No Objectively Reasonable Defenses At the Time of Infringement.

Marvell asserts that a number of defenses should preclude a finding of objective recklessness. *See* Dkt. 700 at 1 – 2, 6 - 10. As discussed above, Mr. Doan did nothing with patents despite knowing that Greg Burd and Zining Wu were using the Kavcic-Moura invention.³⁹ Moreover, CMU has presented evidence that Marvell did nothing in response to request from Fujitsu for an opinion on how the patents related to the C5575M and C7500M chips.⁴⁰ Marvell's inaction establishes that Marvell could not have had any of its purported defenses at the time of infringement because Marvell failed to analyze the patents. Regardless of the subsequent merit of such defenses, there is no evidence of record that Marvell knew about or had the Silvus email or any of the "prior art" at any time prior to this lawsuit.⁴¹ As such, Marvell is asking the Court to do what the *i4i* court specifically rejected:

[I]nvite the Court to adopt a view of willful infringement that would allow an accused infringer to stay willfully ignorant despite a high likelihood that its actions infringe a valid patent. Such a view would allow an infringer to escape a finding of willfulness regardless of its conduct at the time the infringement began as long as it presented many defenses after a formal action was filed. Such a view is inconsistent with both *Seagate* and generally accepted legal principals regarding "objective" legal analysis.

670 F. Supp. 2d. at 581, *aff'd*, 598 F.3d 831, 860 (Fed. Cir. 2010).

a. Dr. Wu's Testimony Confirms that Marvell Had No Prelitigation Defenses That Can Overcome its Objectively Reckless Prelitigation Conduct.

Dr. Wu's testimony firmly establishes that Marvell's response to its knowledge of the patents was **not** fair and reasonable commercial conduct and that Marvell did not have any

³⁸ *See also* P-DEMO 7 at 192.

³⁹ *See supra*, p 12 – 13.

⁴⁰ 12/5/12 Tr. at 251- 252 (Armstrong Depo. at 533:08 - 533:14; 533:19- 534:06, 534:08 - 534:08, 534:10 - 534:14, 535:18 - 535:22.).

⁴¹ For the same reason, Marvell cannot use these post-litigation defenses to establish its "good faith" under subjective prong.

reasonable defenses at the time infringement began. *CSB-System*, 2012 WL 1439059 at *9 n.7; *idi*, 670 F. Supp. 2d at 581 – 82. Dr. Wu was aware of intellectual property rights, and specifically patents, well before Marvell began infringing. 12/13/12 Tr. at 6:11 – 6:13 (awareness of patent system as student in China); *id.* at 18:15 – 18:22 (orientation regarding IP while intern at Quantum); *id.* at 22:16 – 22:25 (orientation at Marvell in 1999 address IP rights); *id.* at 30:21 – 31:7 (starting working on patentable inventions in between 1999 and 2001). In fact, Dr. Wu and Mr. Burd had an understanding of the patent process before they became aware of the CMU patents because they filed for a patent in 2000. *Id.* at 43:3 – 44:20, 66:9 – 67:25 (Dr. Wu testifying that when he came across Dr. Kavcic’s papers he had already filed his first patent and he did not “even think about checking with the Patent Office that there might be a patent that went with the paper.”). Dr. Wu discussed the patent with in-house counsel only in the context of determining the patentability of his own invention in 2002.⁴² *See id.* at 67:14 – 67:25. Moreover, Dr. Wu never looked at the file history in order to inform an opinion regarding the scope of the patents. *Id.* at 73:5 – 73:18.

3. Even If the Court Considers Marvell’s Post-Litigation Defenses, They Do Not Preclude A Finding of Objective Recklessness.

Marvell relies on several “defenses” in attempt to show that its conduct was not objectively reasonable. *First*, these purported defenses do not immunize Marvell’s objectively reckless *prelitigation* conduct. *At most*, these post-litigation defenses, if they were found to be reasonable, could potentially establish that infringement post-dating the filing of the lawsuit was not objectively reckless. *See Power Integrations*, 725 F. Supp. 2d at 480 (evidence of copying, knowledge of the patented features, and their importance to the industry “without adequate investigation into non-infringement and validity of the patents prior to the initiation of this action . . . weighs more heavily than the post-suit strategy developed by counsel to avoid a claim of willful infringement, after such infringement has already occurred.”). Accordingly, Marvell’s

⁴² An objectively reasonable person would know that receiving a patentability opinion for a new invention is not the same as receiving a non-infringement or invalidity opinion.

post-litigation defenses do not foreclose the jury from considering the facts underlying the objective prong and the subjective prong based on Marvell's pre-litigation conduct. *See Seagate*, 497 F.3d at 1374 ("A substantial question about invalidity or infringement is likely sufficient . . . to avoid . . . a charge of willfulness *based on post-filing conduct*" but "willful infringement in the main must find its basis in *prelitigation conduct*.") (emphasis added).

Second, even if the Court considers Marvell's post-litigation defenses, based on all the evidence to date, Marvell has not established that these defenses are reasonable enough to preclude a finding of objective recklessness.⁴³ Marvell's now contradictory non-infringement position⁴⁴ and flawed invalidity arguments do not preclude a finding that Marvell acted despite an objectively high likelihood that its actions constituted infringement of a valid patent.⁴⁵

a. *CMU's Purported "Delay" in Filing Suit is An Unreasonable "Defense" That Cannot Immunize Marvell's Objective Recklessness*

Marvell's contention that the time it took CMU to file suit somehow immunizes Marvell's willful and reckless conduct is utterly illogical. If the actions of the patentee implicated willfulness as Marvell contends, then only post-litigation actions by an infringer could be considered willful. This is not the standard under *Bard* or *Seagate*.

Furthermore, there is substantial evidence of record that neither CMU nor Marvell's customers could tell that the accused chips likely infringed just by looking at them.⁴⁶ Numerous witnesses have testified that it is impossible to determine what circuits are used just by looking at

⁴³ As discussed in CMU's Opposition to Marvell's JMOL on Noninfringement, Marvell's position on infringement is contradicted by its own documents and previous testimony, and is hence, unreasonable.

⁴⁴ See Dkt. 714 and 717 (Motion to Strike Testimony of Marvell Expert Richard Blahut and For Entry of Judgment of Infringement For Accused MNP Chips and Simulators and Brief in Support thereof).

⁴⁵ The weakness of Marvell's non-infringement position is discussed in CMU's Opposition to Marvell's JMOL on Noninfringement and in its Motion to Strike Testimony of Marvell Expert Richard Blahut and For Entry of Judgment of Infringement For Accused MNP Chips and Simulators. As further discussed therein, Marvell's own documents and testimony demonstrate the flawed positions it has taken at trial with respect to infringement. Although, Marvell has not yet introduced any evidence supporting its invalidity arguments, CMU expects that the record at trial will reveal the weakness of these purported defenses, and after Marvell rests, CMU may supplement and/or otherwise amend this opposition.

⁴⁶ Marvell's implicit contention that CMU could file suit based on rumours that Marvell was using the inventions is implausible under Fed. R. Civ. P. 11.

a chip or even by opening it up. 12/3/12 Tr. at 137:8 – 13 (Dr. McLaughlin testifying that “not even with a microscope, if you really looked all the way down, you couldn’t determine how it worked.”); 12/4/12 Tr. at 64:18 – 64:25 (Dr. Bajorek testified that a chip is so complicated that “not even the CIA could reverse engineer a chip to figure out what was in it.”); 12/12/12 Tr. at 61:16 – 64:11 (Dr. Wu also testified that Marvell does not disclose the details of its designs—it’s a secret formula like “coca-cola.”).⁴⁷ In fact, to determine how the chips actually worked and whether they infringed, CMU needed “documents, specifications, presentations, [to] talk to the engineers to find out what’s actually in there.” 12/3/12 Tr. at 138:4 - 134:11; 12/4/12 Tr. at 64:22 – 65:24 (“To really be able to understand what’s inside a chip, you need to get a hold of the design documents for that chip and interview the engineers who worked on the chip.”). Dr. Wu confirmed that this information was not available to CMU because “for you to understand how the circuit’s implemented, the implementation detail, yes, you do need to talk to our people.” 12/12/12 Tr. at 61:16 – 64:11. He also testified that he “would not talk to CMU and tell them what was in [Marvell’s] circuits.” *Id.*⁴⁸

b. *Marvell’s Reliance on the Inventors’ Statements is An Unreasonable “Defense” That Cannot Immunize Marvell’s Objective Recklessness.*

Marvell’s reliance on statements about the optimality and complexity of the Kavcic-Moura invention are not the basis of a defense upon which a reasonable litigant could realistically expect to succeed. As Dr. McLaughlin explained, the difference between an optimal and sub-optimal media detector relates to performance (measured in SNR gain), not infringement. P-279; 12/3/12 Tr. at 58:11 – 58:15, 62:5 – 63:2, 64:2 – 65:13. Dr. McLaughlin

⁴⁷ Moreover, in Marvell’s case, Dr. Sutardja confirmed these points. He testified that “monitoring unauthorized use of technology” in the HDD chip industry is difficult in part because companies keep what they are doing secret. 12/11/12 Tr. at 94:23 – 95:8. He also testified that Marvell, in particular, keeps its designs secret and does not even share the details of its designs with its customers. *Id.* at 95:9 – 95:25.

⁴⁸ Marvell’s assertion that CMU’s purportedly “prolonged failure to act strongly suggests that this case is, at the very least, a close call,” Dkt. 700 at 7, is likewise illogical, especially in light of this evidence regarding the difficulty in determining how Marvell’s chips operate. Further, there is absolutely no evidence linking the timing of the filing of this suit with concerns about the strength of Marvell’s purported defenses.

testified that sub-optimality does not affect the infringement analysis at all—a sub-optimal detector infringes because it still uses the claimed method, but it is called “sub-optimal” because it does not perform as well. *Id.* at 64:23 – 65:13 (“The fact that this uses only two paths, yes, it would affect the performance, but we would be using the method, same method in both [optimal and sub-optimal media noise detector].”); *see also id.* at 71:13 – 72:9 (the sub-optimal version of the Kavcic detector is the detector that uses a two-path trellis, which is ultimately the MNP and both the sub-optimal and optimal versions infringe); *id.* at 76:75 -76:16 (testifying that both the detectors that generated the performance for the optimal Kavcic detector and the Kavcic PP infringe the CMU patents).

Moreover, complexity is not a defense—in fact, Marvell’s own patented iterative technology is more complex than CMU’s patented methods. *Id.* at 193:14 – 194:1 (Dr. McLaughlin testified that between the iterative technology and the patented methods, “[t]he iterative decoder was too complicated [to implement]. They [Marvell] gave up on it at this point in time.”).⁴⁹

Furthermore, Marvell’s reliance on DX-189 (the Silvus email) is also misplaced because an objectively reasonable actor would not have access to these so-called “admissions” (and there is also no evidence that Marvell had access to this email prior to this litigation). An objective actor would only have access to the intrinsic record and would look to that. *See Goss Int’l.*, 739 F. Supp.2d at 1125 -26 (objective prong not met where, in addition to obtaining an opinion of counsel, “[o]nce the Defendants became aware of the application that eventually evolved into the [] patent, **they obtained a copy of the file history and began evaluating whether the patent was valid or infringed.**”).⁵⁰ Further, the Court has already considered the objective value of the Silvus email (DX-189) in its claim construction order:

⁴⁹ Marvell’s non-infringement expert, Dr. Blahut, testified that complexity is not a consideration in determining infringement. 12/13/12 Tr. at 279:4 – 279:24 (Dr. Blahut’s test for infringement includes no discussion of complexity.).

⁵⁰ Dr. Wu testified that he never obtained or read the file history of the CMU patents. 12/13/12 Tr. at 73:5 – 73:18.

The Court gives no weight to this email as it is of the type of extrinsic evidence that *the PHOSITA could not be aware of* since it is a personal email and it post-dates the filing and issuance of the '839 Patent. Furthermore, the email is contradicted by the intrinsic evidence, as discussed below, therefore *even if the PHOSITA were aware of the contents of the email, it would be disregarded in favor of the conclusions that would be drawn from the intrinsic record.*

Dkt. 175 at 39 n.13 (emphasis added).

Accordingly, since an objective actor (assuming he did have access to the email) would disregard the Silvus email in favor of the intrinsic record, that email, *at most*, is only relevant only to the subjective prong.⁵¹

Finally, Marvell's reliance on its own patents is misplaced because they are not a defense as a matter of law. Furthermore, as Dr. Kavcic explained, the word "novel" in a tutorial paper is not used in the same sense of novelty as a legal requirement of patentability. 11/30/12 Tr. at 128:23 – 135:5.

c. Marvell's Reliance on the Court's Summary Judgment Ruling Does Not Establish that Its Invalidity Defense is Reasonable.

Marvell's "close call" argument fails because the Court has already stated that "its summary judgment rulings do not automatically prove that an objectively reasonable defense has been raised." Dkt. 601 at 4; *see also Powell v. Home Depot USA Inc.*, 663 F.3d 1221, 1236 (Fed. Cir. 2011) (affirming district court's determination that the objective prong was met despite its denial of the patentee's request for a preliminary injunction and the closeness of inequitable conduct defense).⁵²

B. CMU Has Presented Sufficient Evidence To Establish That Marvell Knew or Should Have Known of the Objectively-Defined Risk That It Infringed.

CMU has presented substantial evidence to allow a reasonable jury to find that Marvell knew or should have known of the high risk that it infringed. Accordingly, Marvell's JMOL

⁵¹ In this case it is not even relevant to the subjective prong because there is evidence that Marvell had access to it.

⁵² Marvell has yet to present any evidence of invalidity at trial, and as indicated above, CMU may supplement and/or otherwise amend this opposition after Dr. Proakis offers his opinions.

should be denied on this issue and the question of subjective willfulness should go to the jury.

a. Marvell Named Its Simulators after Dr. Kavcic

Marvell named its simulators after Dr. Kavcic: “KavcicViterbi” (the “optimal” detector, which Marvell uses as a benchmark”) and “KavcicPP” (which is the MNP simulator). *See* P-110 (Kavcic PP code); P-93 (Kavcic Viterbi code); 12/3/12 Tr. at 54:18 – 55:11 (the code that implemented the Kavcic detector implements the claims of the patents).

b. Marvell Had No Subjective Belief about Non-Infringement or Validity

Marvell’s failure to act in spite of its knowledge of the patents is not only objectively reckless, but it also precludes a finding that, at the time it began infringing, Marvell had any subjectively reasonable basis for believing that it did not infringe or that the patents were invalid. Since Marvell violated its own IP policy by not forwarding the patents to its legal department, its Vice-President of Read Channel Development and Signal Processing did not even review the patents,⁵³ it did not review the file history, and it never sought assistance of counsel, Marvell could not inform its subjective beliefs regarding the patents. Even if Marvell had analyzed the scope of the patents, there is no evidence to indicate that, at the time of infringement began, Marvell had any of the prior art it now contends invalidates the patents. Similarly, there is no evidence that Marvell had or knew about the Silvus email (DX-189), and thus that is also irrelevant to Marvell’s subjective beliefs at the time of infringement.

The cases Marvell’s cites in support of its argument that Marvell did not have the requisite subjective intent are inapposite because Marvell does not (and cannot) assert an opinion of counsel defense.⁵⁴ *See* Dkt. 700 at 15 – 16; *Cohesive Techs., Inc. v. Waters Corp.*, 526 F. Supp.2d 84, 104, 105 (D. Mass. 2007) (there was not clear and convincing evidence of willful infringement because that defendant “did not copy” and “engaged in sufficient due diligence in

⁵³ 12/10/12 Tr. at 262 (Doan Depo at 129:18 – 130:01, 130:04 – 130:08)

⁵⁴ As indicated above, despite Dr. Wu’s testimony, Marvell represented to the Court and CMU in 2010 that it did not have any opinion of counsel defense. *See supra*, n.23.

determining whether its product would infringe to convince me that its effort to avoid infringement was in good faith.”); *TGIP, Inc. v. AT&T Corp.*, 527 F. Supp. 2d 561, 579 (E. D. Tex. 2007) (defendant received and relied upon opinion letters from outside counsel; defendant’s counsel’s correspondence with Plaintiff’s predecessor set out defendant’s invalidity and non-infringement positions); *Goss Int’l Americas, Inc. v. Graphic Management Assoc., Inc.*, 739 F. Supp.2d 1089, 1125 -26 (N.D. Ill. 2010) (defendant relied on an opinion letter from outside counsel *and* obtained the file history to conduct its own investigation).⁵⁵ In *Cohesive Techs.*, several affirmative steps were taken to investigate the patents and avoid infringement: (1) the engineer forwarded the patent in question to in-house counsel; (2) the engineer himself then compared the patentee’s prototype product to his proposed design “in order to determine whether [plaintiff’s] patents would preclude defendant from selling” its product”; (3) the marketing manager then held a meeting with scientists and in-house counsel to discuss whether their products infringed; and (4) in-house counsel subsequently drafted an opinion that that the products would not infringe. *Id.* at 104 – 105. There is *no evidence* of record that Marvell took *even one* of these actions.⁵⁶

c. CMU Has Proved that Marvell Copied⁵⁷ the CMU Patents.

⁵⁵ See also *Honeywell Int’l Inc. v. Universal Avionics Sys. Corp.*, 585 F.Supp. 2d 636, 644 (“[P]erforming a patent review before entering the market with a new device evidences that [Defendant’s] conduct was not reckless.”). Further, Marvell’s reliance on *Informatica Corp. v. Bus. Objects Data Integration, Inc.*, 527 F. Supp.2d 1076 (N.D. Cal. 2007), is also inapposite, because in that case the court does not review the willfulness analysis, but simply determined not to enhance damages.

⁵⁶ Moreover, the *Cohesive Techs.* court lists a number of considerations regarding willfulness that are particularly relevant to the facts in this case: “In determining whether infringement is willful, a court should consider: (1) whether there was a bona fide disagreement regarding patent invalidity or infringement, (2) whether the *infringer solicited or followed the advice of counsel*, (3) *whether there was continued infringement after notice of probable infringement was received*, (4) whether there was a degree of similarity between the patented and accused devices, (5) *whether the infringer took efforts to avoid infringement*, and (6) whether the infringer was indemnified against infringement costs.” *Id.* at 103 – 104 (emphasis added).

⁵⁷ As indicated above, some courts find copying relevant to both the objective and subjective prongs. For simplicity, we discuss it under the objective prong, but the same evidence shows that Marvell knew that of the risk that, by copying, it was infringing the patents. See, e.g., *Power Integrations*, 725 F. Supp. 2d at (D. Del. 2010) (copying relevant to both Seagate prongs because evidence of copying was strong and measures taken by infringer to avoid infringement were so weak “that it is hard to understand how one could objectively believe such actions would not constitute a high likelihood of infringement.”).

As discussed above, CMU has presented substantial evidence of copying that provides a sound evidentiary basis for a reasonable jury to infer that Marvell had the requisite subject intent.

d. Marvell's Arguments Do Not Immunize Its Subjective Intent.

Marvell's remaining arguments are insufficient to change the fact that, given its knowledge of the patents, its failure to take any investigative or remedial actions, and its copying of the invention, Marvell knew or should have known of the high likelihood of infringement. CMU's acknowledgment of Marvell as a "Technology Innovator" is entirely irrelevant to Marvell's subjective belief regarding the likelihood of infringement. *See* Dkt. 700 at 13. Similarly, Marvell's argument that CMU's failure to follow up on its 2003 letter "*reinforced* Marvell's subjective good faith intent" is fanciful because it would require some showing of good faith intent. Yet the record shows that Marvell failed to take any affirmative action in investigating or designing around the patents and instead "disassociated" Kavcic's name from its MNP as soon as it started shipping MNP-type products. *See* 12/11/12 Tr. at 307:3 – 308:2. Furthermore, the onus is not on the patentee "to call Marvell" as Marvell suggests. Dkt. 700 at 13-14.

IV. CONCLUSION

CMU respectfully requests that the Court deny Marvell's motion for Judgment as a Matter of Law of no objective willfulness and find that the objective prong has met such that the jury can determine whether the subjective prong.

Respectfully submitted,

Dated: December 17, 2012

/s/ Christopher M. Verdini

Patrick J. McElhinny Pa. I.D. # 53510

patrick.mcelhinny@klgates.com

Mark Knedeisen Pa. I.D. #82489

mark.knedeisen@klgates.com

Christopher M. Verdini Pa. I.D. # 93245

christopher.verdini@klgates.com

Douglas B. Greenswag (admitted *pro hac vice*)

douglas.greenswag@klgates.com

925 Fourth Avenue, Suite 2900

K&L Gates LLP

Seattle, WA 98104-1158

Phone: 206.623.7580

K&L Gates LLP
K&L Gates Center
210 Sixth Avenue
Pittsburgh, PA 15222
Phone: (412) 355-6500

Counsel for Plaintiff, Carnegie Mellon University

CERTIFICATE OF SERVICE

I hereby certify that on December 17, 2012 the foregoing was filed electronically.
Notice of this filing will be sent to all parties by operation of the Court's electronic filing system.
Parties may access this filing through the Court's system.

s/ Christopher M. Verdini
Christopher M. Verdini, Pa. I.D. # 93245
christopher.verdini@klgates.com
K&L GATES LLP
K&L Gates Center
210 Sixth Avenue
Pittsburgh, PA 15222
Phone: 412.355.6500
Fax: 412.355.6501